E. F. HARMER.

METHOD AND MEANS OF SPRINGING THE DRIVING WHEELS OF CYCLES, MOTORCYCLES, CYCLE CARS OR THE LIKE.

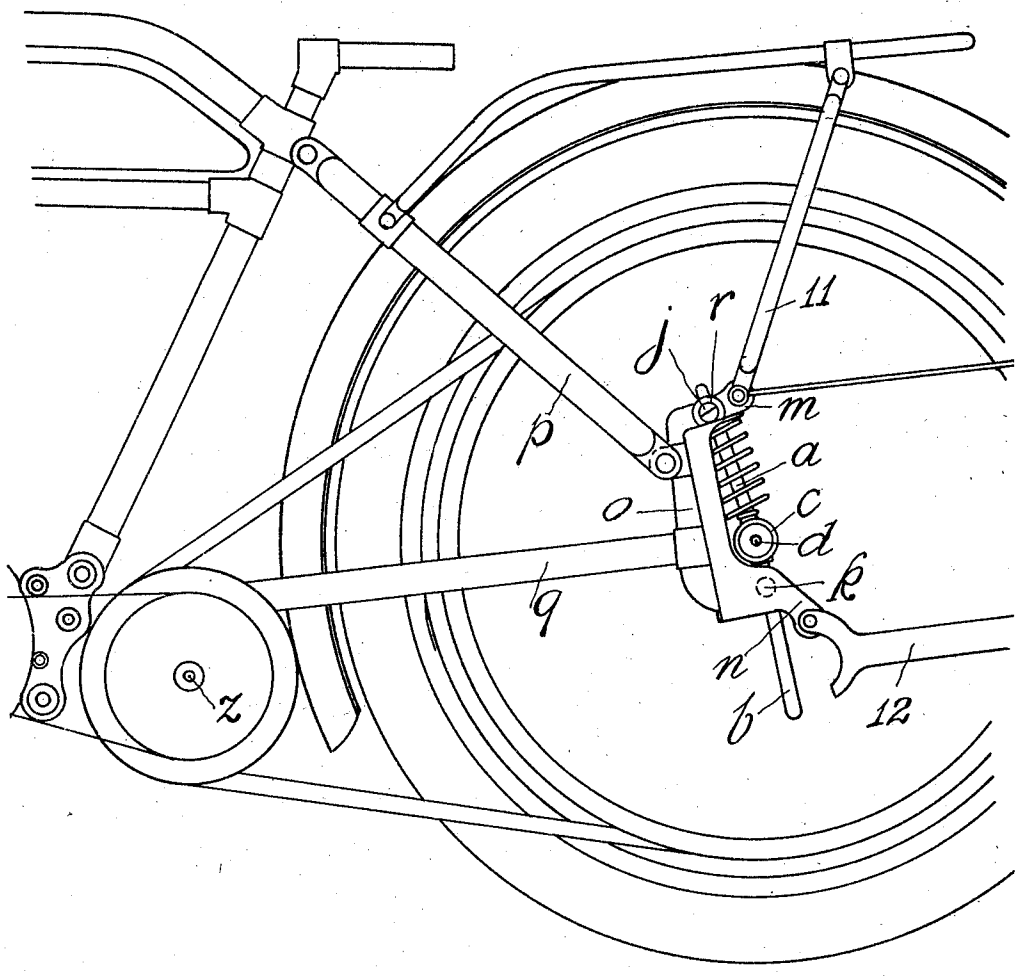
APPLICATION FILED JULY 7, 1919.

1,361,382.

Patented Dec. 7, 1920.

5 SHEETS—SHEET 1.

Fig. 1



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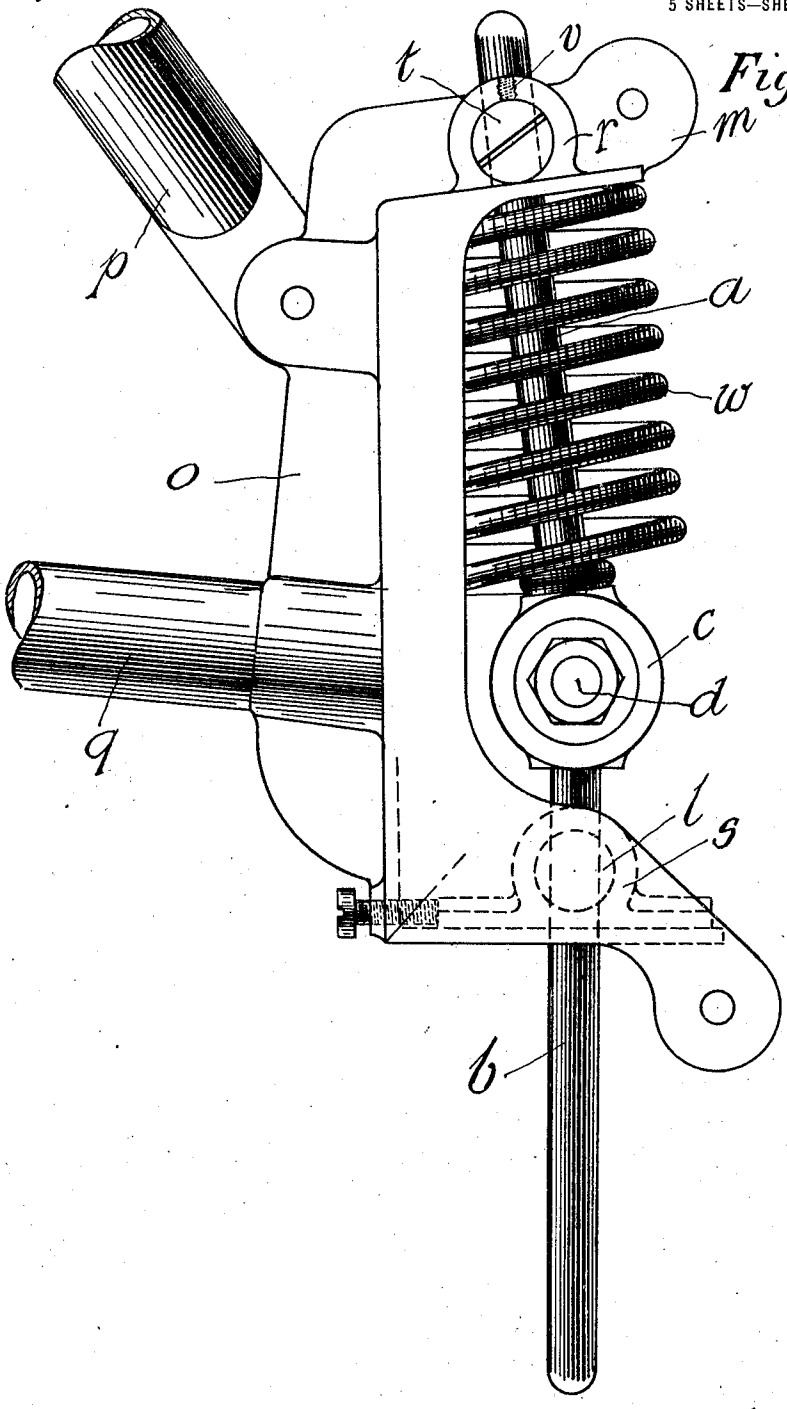
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5 SHEETS—SHEET 2.

Fig. 2



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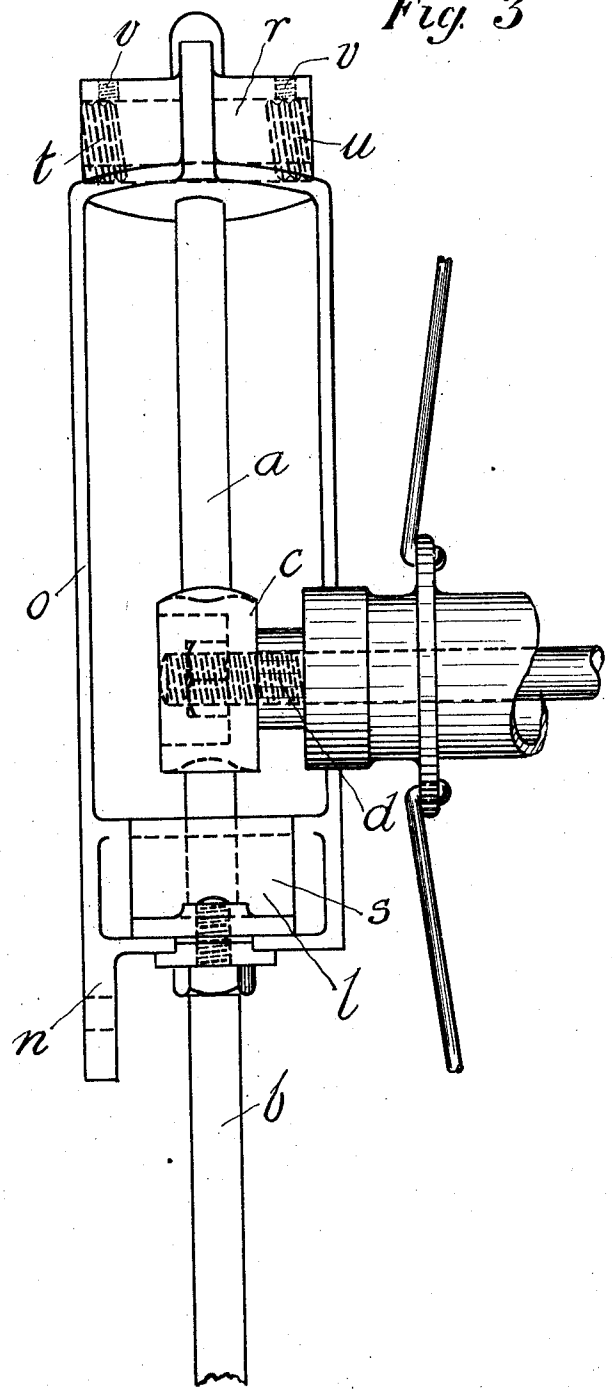
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5 SHEETS—SHEET 3.

Fig. 3



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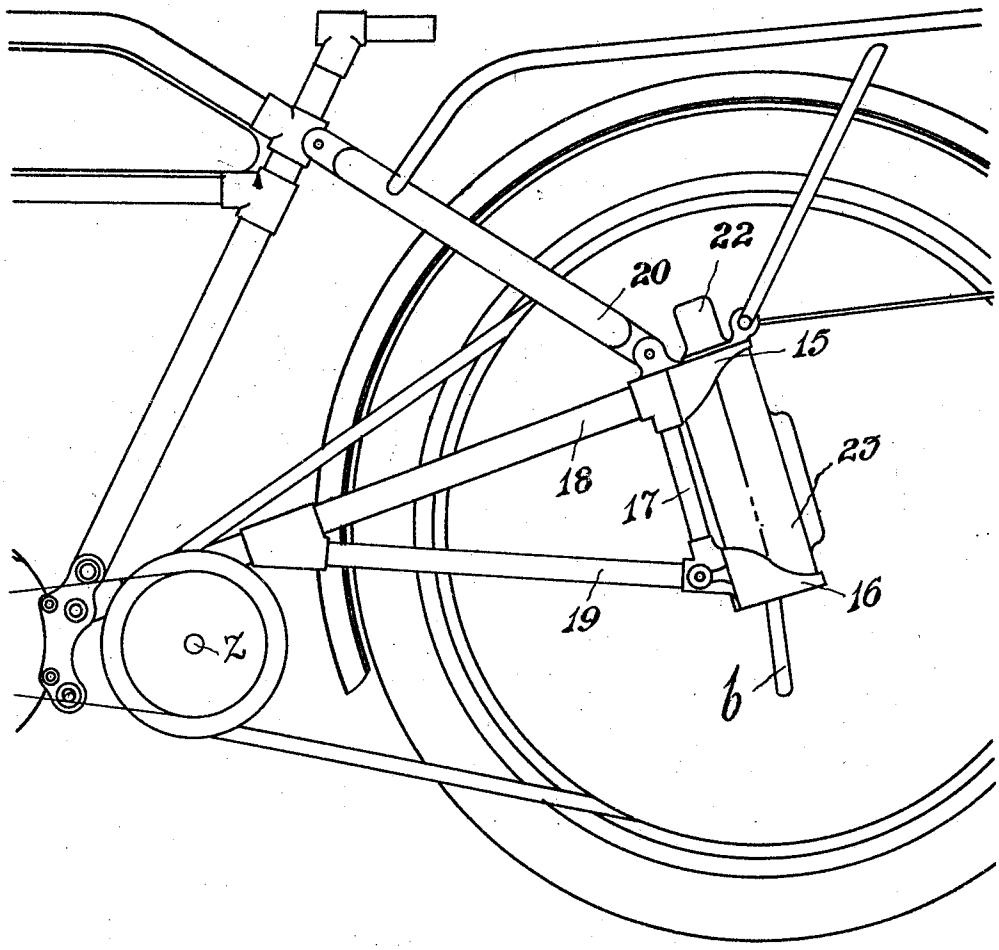
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5 SHEETS—SHEET 4.

Fig. 4



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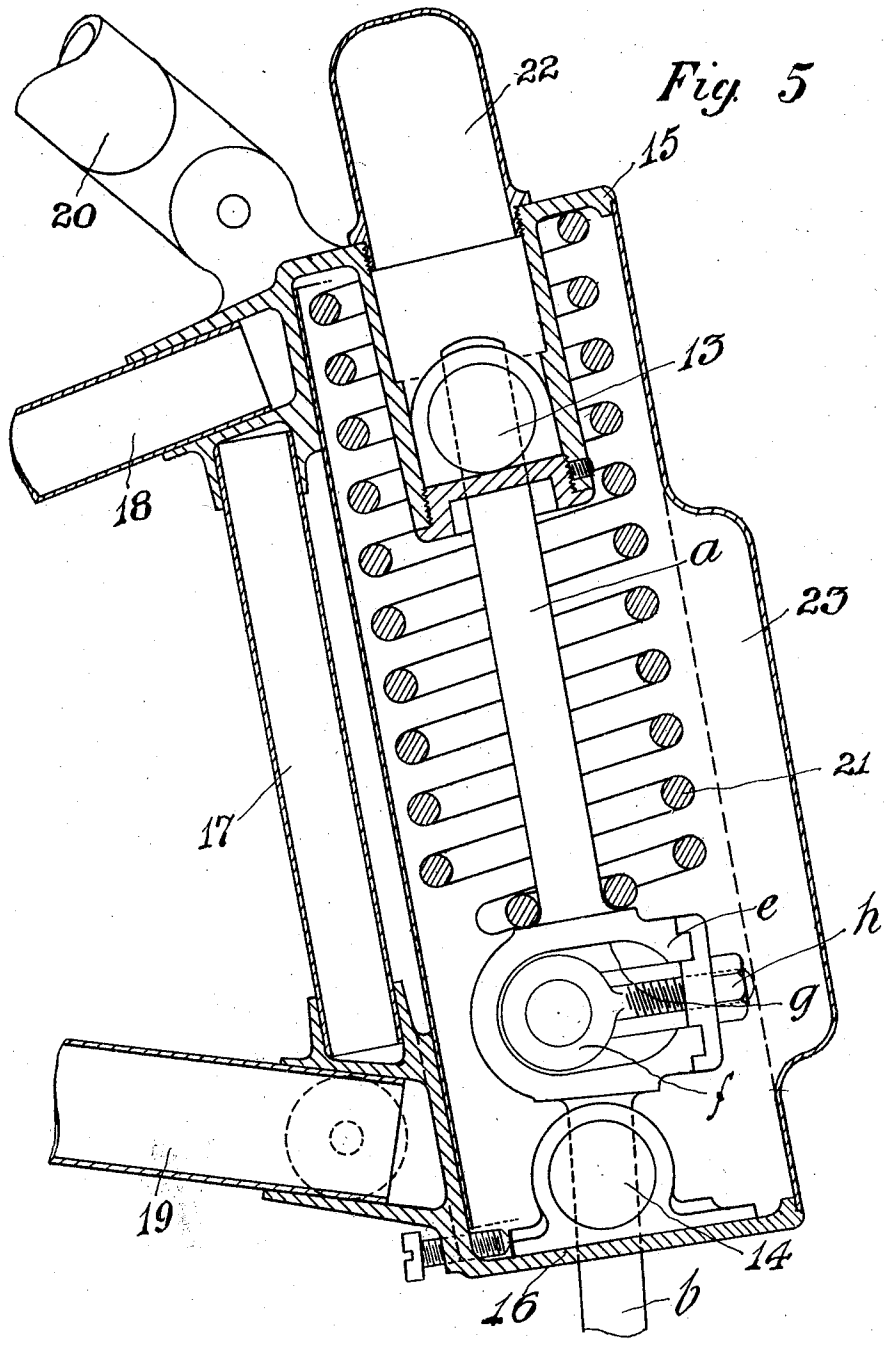
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5 SHEETS—SHEET 5.

Fig. 5



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UNITED STATES PATENT OFFICE.

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METHOD AND MEANS OF SPRINGING THE DRIVING-WHEELS OF CYCLES, MOTOR-CYCLES, CYCLE-CARS, OR THE LIKE.

1,361,382. Specification of Letters Patent. Patented Dec. 7, 1920.

Application filed July 7, 1919. Serial No. 309,094.

To all whom it may concern:

Be it known that I, ERNEST FREDERICK HARMER, subject of the King of Great Britain, and residing at Gresham Villa, Mansion Road, Southampton, England, civil engineer, have invented a certain new and useful Improved Method and Means of Springing the Driving-Wheels of Cycles, Motorcycles, Cycle-Cars, or the like, of which the following is a specification.

This invention relates to a method and means for springing the driving wheel of a cycle, motor cycle, cycle car or the like, and has for its object to provide an improved device which will perform the usual functions of a spring frame in absorbing vibrations and preventing said vibrations from being transmitted to the frame of the machine; and further will insure that the distance between the wheel spindle and the axis of the pulley or like driving means will remain unaltered at any position of the spring wheel in respect to the frame. The line of travel described by the driving wheel axle is thus constantly concentric with the engine or gear box pulley, sprocket wheel, or bevel pinion in case of shaft drive.

To attain this object I utilize a well known geometrical function whereby any two straight lines inclined at an angle to one another, if slid along in contact with two fixed points, will at their point of intersection describe a portion of a circle.

In accordance with my invention I provide at each side of the machine two sliding members set at a suitable angle say in a boss or collar into which the wheel axle is suitably secured, and to arrange that the arc described by their apex or point of intersection (coincident with the boss or the like) shall be concentric to the axis of the pulley or the like. These sliding members slide through fixed points which are equidistant or substantially so from the said axis.

The said fixed points may be comprised of trunnions suitably disposed in projecting arms or in a frame piece integral with or fitted at the intersection of the frame back forks. These trunnions are rotatably mounted in bearings in the said frame member so that they may revolve sufficiently to permit the sliding movement of the arms therein through the fixed points.

The spring may for example be applied as a helical or volute spring between one of the fixed points and the part carrying the wheel axle, or as a laminated spring bearing upon one of the sliding members or in any other manner so that it yieldingly resists the movement of the wheel axle under shocks or the like.

Instead of the sliding arms a member or members may be set at a suitable angle and secured to the frame with the oppositely inclined parts each tangential to an arc described from the axis of the driving pulley or the like, and a pair of sleeves are fitted one on each inclined part, and are mounted by knuckle joints to a bracket to which the wheel axle is secured. The sleeves and the bracket are thus adapted to slide upon the angle member so that the wheel axle describes a path substantially concentric with the pulley or like axis. A spring may be applied in any suitable manner between the bracket and frame to yieldingly resist the sliding movement of the wheel bracket on the said members or arms.

The drawings show examples of the invention applied to a motor cycle frame in which—

Figure 1 is a side elevation showing one embodiment with a helical spring arrangement.

Fig. 2 is a detail view of the sliding members in the arrangement seen at Fig. 1.

Fig. 3 is a view taken at right angles to Fig. 2 showing the back with spring removed.

Fig. 4 is a side elevation showing another embodiment of construction with helical spring contained in casing.

Fig. 5 is a sectional elevation of the sliding members seen at Fig. 4.

Two sliding members *a* and *b* at each side of the machine are set at a suitable angle to one another in a boss or collar *c* into which the wheel axle *d* is suitably secured, as in Fig. 1, or these sliding members may be set in a frame *e* as in Fig. 5 into which a boss or collar *f* is slidably adjustable in a guide *g* therein and set by bolts *h*, to adjust the tension on a chain drive, for example.

The sliding members slide through fixed points *j* and *k* which are equidistant or substantially so from the axis of the pulley *z* or like driving means. The said fixed points *j* and *k* are comprised of trunnions *l* rotatably mounted in bearings *r* and *s* in arms *m* and *n* respectively, in a frame piece *o* in-

tegral with or fitted at the intersection of the frame back forks p and q so that the said trunnions may turn in accordance with the sliding movement of the arms through the fixed points. The bearing s is slidably adjustable on the arm n to adjust and set the fixed point equidistant from the pulley z or like driving means, and the trunnions l are laterally adjustable in the bearings r and s by screws t and u to compensate for any small errors in assembling, which screws after being set to the desired position are secured against accidental unscrewing by a screw v on the threads.

A helical spring w is applied between the top arm m and the boss or collar c of the frame e, and preferably a second helical spring may also be fitted below the lower arm n held by a pin or the like, at the end of the sliding member b for excessive road shocks. Both these springs may be inclosed in a casing (not shown), and I may also use laminated springs instead or in conjunction with the device hereinbefore described.

Laminated springs may also be fitted to the underneath side of the rear fork members to yieldingly resist the upward movement of the arm b and the wheel axle.

The carrier back stay 11 is fixed at the extremity of the upper projecting arm m and is thus sprung equally with the frame, while the stand 12 may be secured in the usual way to the extremity of the projecting arm n.

In the embodiment shown in Figs. 4 and 5 the fixed points 13 and 14 are mounted in independent lugs 15 and 16 respectively joined by a bar or tubular member 17, while said lugs are brazed or otherwise secured on chain stays 18 and 19, and the lug 15 is further bolted or otherwise secured to the back stay 20.

A suitable casting 23 incloses the spring 21 and a dust cover 22 is mounted on the top of lug 15 inside which cover will travel the sliding member a.

I claim:—

1. Improved means for springing the driving wheel of a cycle, motor cycle, cycle car, or the like, consisting in mounting the wheel at the angle of pairs of straight sliding members sliding in fixed guides equidistant from the axis of the driving pulley or the like so that the travel of the axis of the driven wheel is concentric about the axis of the driving means.

2. Improved means of springing the driving wheel of a cycle, motor cycle, cycle car, or the like, consisting in mounting the wheel at the angle of pairs of straight members set at an angle to each other, said members sliding in pivoted guides on the frame equidistant from the axis of the driving means constraining the axis of the wheel to move in a path concentric about the axis of the driving means.

3. Improved means for springing the driving wheel of a cycle, motor cycle, cycle car, or the like, consisting in a boss or the like for receiving a wheel axle arranged at the angle of intersection of two straight sliding members, which members slide through rotatable bearings at fixed points in a frame member equidistant from the axis of the driving means, and a spring between the said boss and the frame member adjacent one of the said bearings.

4. Improved means for springing the driving wheel of a cycle, motor cycle, cycle car, or the like, comprising a frame member at each side of the wheel carrying pivotal bearings at fixed points equidistant from the axis of the driving means, a pair of straight members in each frame member set at an angle to each other and sliding in said bearings, a connection for the wheel axle at the point of intersection of the pair of straight members, and a spring to resist the movement of the wheel and the consequent sliding of said straight members in said bearings.

5. Improved means for springing the driving wheel of a cycle, motor cycle, cycle car, or the like, comprising a frame member at each side of the wheel, said frame member carrying pivotal bearings at points fixed equidistant from the axis of the driving means, a pair of straight members set at an angle to each other and sliding in the said bearings on each side of the wheel on said frame members, a connection for the wheel axle at the point of intersection of the pair of straight members, and the application of a spring to resist the movement of the wheel and the consequent sliding of said members in said bearings.

6. The improved means for springing the driving wheel of a cycle, motor cycle, cycle car or the like, as in claim 5 with adjustment means for the said bearings in the frame member substantially as set forth with reference to the drawings.

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